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Teachers' Contextualized Conceptions of Critical Thinking

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Abstract

Research conceptions are thought to have a powerful influence on teachers' practices with respect to integration of research in teaching. However, specific relationships between teachers' research conceptions and research integration practices have not been fully documented. This paper focuses on teachers' contextualized research conceptions as a mediator between teachers' general research conceptions and teaching practices. Contextualized research conceptions are teachers' interpretations of their general research conceptions, taking into account their teaching context. In particular, the paper focuses on teachers' contextualized research conceptions of 'Critical Thinking' (CT), as this is a prominent attribute of teachers' general research conceptions. Participants were 79 teachers from five teaching-intensive institutions in higher education. From their teaching context, teachers interpreted CT in four different manners: (1) Critical attitude towards oneself, (2) Critical attitude towards information, (3) Conscious of the perspective of others, and (4) Able to handle uncertainty. This diversity in interpretations of CT highlights the difficulties in finding relationships between teachers' general research conceptions and research integration practices when a general definition of CT is started from and teachers' contextualized understanding of CTs are not included

Keywords: Research-teaching nexus, Conceptions, Teaching practices, Non-university sector, Qualitative research, Critical Thinking

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Introduction

Relationship between research and teaching

Research and teaching are considered as two defining characteristics of higher education (Durning & Jenkins, 2005; Trowler & Wareham, 2008). Pleas for strengthening the link between research and teaching or for enhancing the integration of research into teaching are repeatedly made. The value of the link between research and teaching is often defended by considering the idea that research would not only be beneficial for learning specific research skills but also for acquiring competences that transcend research (Levy & Petrulis, 2012). One of these competences is the development of 'Critical Thinking' (CT) (Heggen, Karseth, & Kyvik, 2010). The development of CT is a central goal in higher education (King & Kitchener, 2004) as it is considered to be part of a research disposition (van der Rijst, 2009) and to be crucial to function in a complex contemporary society (Bok, 2006). Not surprisingly there is a strong movement in higher education to increase the research experience of students (Spronken-Smith, Walker, Batchelor, O'Steen, and Angelo, 2012). However a close relationship between research and teaching in higher education is hampered by the lack of consensus on the precise meaning of 'a close relationship'; its elements, and the processes involved (Annala & Makinen, 2011; Spronken-Smith et al., 2012; Trowler & Wareham, 2008). Indeed, the relationship between research and teaching and its components are differently understood by different authors (Brew, 2012; Healey, Jordan, Pell, & Short, 2010).

Research conceptions and teaching practices

The literature pays considerable attention to teachers' research conceptions for explaining the research-teaching relationship (see e.g., Brew, 2003; Visser-Wijnveen, 2009). Research conceptions are thought to have a powerful influence on teachers' teaching practices, in particular research integration practices (see, e.g., Brew, 2003; Robertson & Bond, 2001; Visser-Wijnveen, van Driel, van der Rijst, Verloop, & Visser, 2010). However, there is a paucity of evidence illustrating any direct link between research conceptions and teaching practices. Although research conceptions (see, e.g., Kiley & Mullins, 2005; Griffioen, 2013) and teaching practices, in particular research integration practices (see, e.g., Zimbardi & Myatt, 2012; Verburgh, 2013), have been separately well explored, specific relationships have not yet been fully documented.

Conversely, relationships between teachers' teaching conceptions and teaching practices are well studied. Nevertheless research findings are inconclusive showing congruence (see, e.g., Kember & Kwan, 2000; Laksov, Nikkola, & Lonka, 2008; Martin, Prosser, Trigwell, Ramsden, & Benjamin, 2000; Verloop, Van Driel, & Meijer, 2001) as well as incongruence (see, e.g., Aguirre & Speer, 2000; Kane, Sandretto, & Heath, 2002; Murray & MacDonald, 1997; Trigwell & Prosser, 1996) between teaching conceptions and teaching practices. In order to better understand the inconclusive results Norton, Richardson, Hartley, Newstead, and Mayes (2005) made an interesting suggestion. They pointed to the contextualisation of teachers' general teaching conceptions, referred to as intentions, mediating between teachers' general teaching conceptions and teaching practices. They showed that these contextualisations are related to teachers' general teaching conceptions as well as to the teaching context in which they operate. In other words, Norton et al. suggested a possible explanation for the inconclusiveness on the relationship between teachers' teaching conceptions and teaching practices and pointed at teachers' contextualized teaching conceptions as a mediating and explaining variable.

These insights of Norton et al. (2005) provide a suitable framework for investigating the hazy relationship between research conceptions and teaching practices, in particular research-integration practices (see Figure 1). Building on the idea of Norton et al., relationships between teachers' research

conceptions and their research integration practices might be hard to find unless teachers' contextualized research conceptions are considered. According to this line of reasoning the interaction between teachers' general research conceptions and their teaching context result in teachers' contextualized research conceptions.

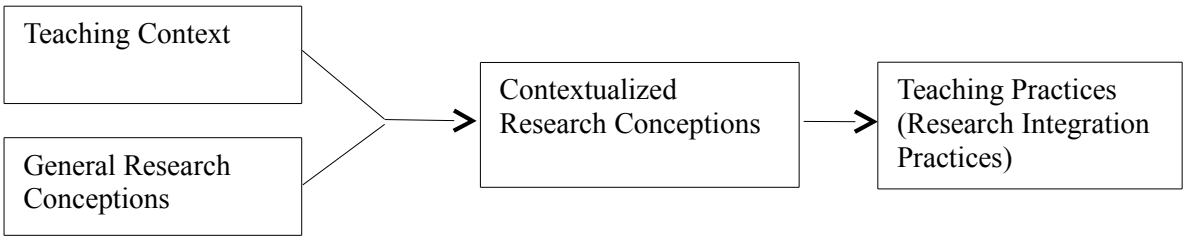

Figure 1 Framework for investigating relationships between teachers' general research conceptions, teachers' contextualized research conceptions and research integration practices

Research question

This study builds on an earlier study in which teachers' general research conceptions were investigated (Schouteden, Verburgh, & Elen, 2014). Three categories, containing two to eight attributes that constitute research, were found: (1) Research steps, (2) Qualities of research processes, and (3) Qualities of researchers. When discussing 'Research steps' teachers mentioned eight research attributes that can be considered as different steps in doing research. The two research attributes within 'Qualities of research processes' referred to ways in which research is conducted, taking into account the quality and design of research processes. The eight research attributes discerned within 'Qualities of researchers' referred to different personality traits that are crucial for doing research. Table 1 presents an overview of the general research attributes, illustrated with quotes of the participants.

CT, part of the category 'qualities of researchers', emerged as a prominent research attribute that participants across all focus groups evoked when discussing their general research conceptions. In addition to direct references to CT, common expressions included phrases such as 'being critical', 'not taking the apparent for true', and 'constant questioning' This focus on CT is in line with the widespread agreement on the importance of the development of CT in students in higher education (Abrami, Bernard, Borokhovski, Wade, Surkes, Tamin, & Zhang, 2008; King & Kitchener, 2004).

Building on the idea of Norton et al. (2005), relationships between teachers' general research conceptions, in casu CT, and their research integration practices might be hard to find unless teachers' contextualized conception of CT are considered. Therefore this analysis investigates teachers' interpretations of CT when their teaching context comes to the front.

Table1

General research conceptions

Categories	General research attributes	Description *Quote*
Research steps	(1) Formulating a research question	Formulating research questions and hypotheses. *'You always have a starting point. It is something you question. From this questioning, the research starts.'* (F/2.4.3)
	(2) Finding information	Retrieving relevant information in books, scientific journals, etc. for interpreting or theorizing a research question. *'Doing research is looking for information in the professional setting, (..) but also looking for theoretical or practical insights in literature.'* (F/2.4.4)
	(3) Developing a research design	Devising a suitable design for answering a given question. *'Based on your research question, you are going to develop a suitable research design.'* (B/2.6.6)
	(4) Collecting data	Gathering appropriate data for answering a research question. *'Doing research includes collecting data. I think in the first place of: testing persons, doing interviews, conducting surveys, conducting focus groups, etc.'* (B/2.6.6)
	(5) Analyzing data	Conducting a data analysis according to the scientific standards. *'Research is like untwining one big tangle. You have a lot of data without any structure. You, as a researcher, have to organize or structure those data. You have to classify data, put data next to one other, demonstrate connections, etc.'* (A/1.3.3)
	(6) Formulating conclusions	Incorporating and transcending the collected data with a critical interpretation. *'Based on the available data and consideration, you try to formulate an accurate conclusion which is an answer on the postulated question.'* (D/1.3.2)
	(7) Reporting	Dissemination of research results for the scrutiny of peers. *'Research results have to be published in technical journals of importance within the discipline to make the results known in the field of action'.* (F/2.4.2)
	(8) Linking research and professional practice	Seeing the usefulness of research results within professional practice or, the other way around, looking for new research results to solve a professional problem. *You have to search for new insights and scientific research results. Meanwhile you have to ask yourself: "What do these results mean for me? What do these results mean for my professional practice?"'* (F/2.3.3)
Qualities of research processes	(1) Quality indicators	Technical quality aspects (e.g., validity, reliability), and quality aspects related to correctness of the research (e.g., ethical correct, a random sample). *'You have to work accurate. When you interpret data or results, you must have sufficient evidence to formulate solid conclusions. You have to be very careful. Being careful in formulating your conclusions is a necessary condition for doing research.'* (F/2.3.3)

	(2) Nature of the research process	The way research is designed (e.g. cyclical research process, linear research process). *Doing research is a cyclical process of answers leading to new questions'* (A/1.3.1)
Qualities of researchers	(1) Critical thinking	Critical attitude towards information, knowledge or knowledge constructing. '*A researcher has to continuously question himself. For example: you cannot delete or ignore data, you always have to interpret your data in a broad framework, you have to be careful with the conclusions you formulate, you have to work according to scientific rules, you have to critically assess your results.*' (F/2.3.3)
	(2) Organizational capabilities	Managing skills, such as planning, managing the finances, coordinating, etc. *'Research (...) includes a lot of administration [for the researcher]: submitting research proposals, applying for finances, etc.'* (F/2.4.3)
	(3) Research attitude	The attitude to question things, to look further than the given information and the willingness to know. '*If you are doing research, this is no 'nine to five' job. You are also thinking about it in the evening: you think about a text you want to adapt, you think about something you're planning to do tomorrow, etc*.' (F/2.4.3)
	(4) Basic skills	Writing, listening and reading skills. *'Doing research implies reading, writing, talking and listening skills [of the researcher]. We often forget this. But reading, is not just reading words, it is understanding an argumentation. Writing implies writing without writing errors, scientific writing, but also writing down your ideas. And you have to be able to talk and listen to others, because doing research is often together with others.'* (B/2.6.1)
	(5) Co-operative working	Working and interacting with others, such as other researchers or practitioners. *You [as a researcher] need skills to work with others: skills to interpret data together, to question each other, to compare one another's analyses , etc.'* (F/2.3.3)
	(6) Discipline specific knowledge	Knowledge of theoretical, conceptual or methodological frameworks that are relevant within the discipline. *'As a researcher you look to the world from a certain point of view/ through coloured glasses (...) These glasses might be coloured by [professional] experience, but they have to be complemented with scientific insights (...) You have to complement intuition, insight into human nature and experience with scientific understandings and insights [from the discipline].'* (B/2.6.1)
	(7) Innovative	Creation of new knowledge and acting or thinking in a non-formulaic way. *'As a researcher you have to take a training from time to time, and you have to search constant for new or innovative insights, methods, scientific publications, etc.'* (F/2.3.3)
	(8) Systematic way of reasoning	Applying a heuristic way of reasoning appropriate in the scientific discipline for approaching a professional problem or answering a research question. *'I think about a protocol which has to be followed [by the researcher]. It is agreed by everyone, it is a certitude which you cannot ignore. (...) A protocol brings systematic into your way of reasoning and acting.'* (F/2.3.1)

Method

Data collection

Data were collected as part of a more broad data collection. Data were collected in focus groups in which drawings were used as the entry point. Drawings proved to be a valuable tool to access teachers' teaching conceptions (see, e.g., Briell, Elen, Depaepe, & Clarebout, 2010; Herremans & Elen, 2012; Murphy, Delli, & Edwards, 2004). Nevertheless accessing conceptions is difficult as they are often held unconsciously (Pajares, 1992). Teachers do not always have the words to describe their conceptions or may not be willing to describe them if they hold unpopular conceptions (Visser-Wijnveen, 2009). According to Weber and Mitchell (1996) drawings offer a different kind of glimpse into human sense making than written or spoken texts, as they can express what is not easily put into words. Moreover drawings provide a rich source of information because they include contextual factors and a reflection of the mental images one has (Hancock & Gallard, 2004). As far as we know, drawings have not yet been used to gain insight into research conceptions. While drawings proved to be a valuable tool to access teaching conceptions, Briell et al. (2010) suggested to complement the use of drawings with oral or written explanations because they help to interpret the drawings. Focus groups are chosen to supplement the drawings for two reasons. First, given their naturalistic interaction and direct access to the language that structures participants' experiences, focus groups are particularly useful for reflecting the realities of a group (Fern, 2001). Whereas individual interviews provide in-depth information about a single individual, focus groups provide combined perspectives on a topic (Kvale & Brinkmann, 2009). Secondly, focus groups proved to be an excellent method to investigate new and sensitive topics (Bloor, Frankland, Thomas, & Robson, 2001; Kvale & Brinkmann, 2009; Smithson, 2000) which is the case in this study given the new focus on research in teaching-intensive institutions. Nevertheless Barbour and Kitzinger (1999) argue that focus groups are more difficult to control in comparison to interviews and might silence individual voices of dissent. Drawings counter both limitations as they give each participant, even the more silent ones, the opportunity to express one's own research conception prior to discussing it in group. In addition drawings provide the moderator a materialized go-between to control the focus groups.

Focus groups consisted of five phases. Each focus group started with introductory questions about participants' teaching and research experiences. Next, participants were asked to visually represent a person doing research. After five minutes of drawing, participants were asked to explain their drawings to the other participant(s) and the moderator. These explanations allowed the moderator to inquire deeper about participants' general research conceptions and assured everyone got the opportunity to discuss his general research conception. In the fourth phase the moderator identified, in cooperation with the participants, key topics in the discussion of the drawings and wrote them down on small cards. The moderator used the words of the participants and not her own wordings. The words on the small cards are general research attributes, for example: 'collecting data'. In the fifth phase participants were asked to specify the importance and meaning of the general research attributes (small cards) for their teaching context. In this phase participants' contextualized research conceptions were discussed.

The main role of the moderator was to guide the discussion through the different phases of the focus group. The only supplementary questioning that occurred was to solicit clarification when a statement was unclear. Focus groups typically lasted 90-120 minutes.

Participants

In 20 focus groups 79 teachers participated. They came from seven programs organized in five teaching-intensive institutions in Belgium (Table 2). Focus groups were organized by program. Some programs led to the same degree, for example: social work. All programs were three year-bachelor programs with a professional orientation. They were scaled at level 5 in the International Standard Classification of Education of the OECD (OECD, 2013). As the influence of discipline on teachers' research conceptions is unclear (see, e.g., Brew, 2001; Prosser, Martin, Trigwell, Ramsden, & Lueckenhausen, 2005; Visser-Wijnveen, 2009), all programs were selected from the same disciplinary area: soft-applied sciences (Biglan, 1973). Each program voluntarily participated in this study and each program director considered research integration an important aspect of the educational mission. There were 45 woman and 34 men, which is a typical distribution in gender for teachers at bachelor programs in Belgium (Hazelkorn & Moynihan, 2010).

Table 2
Characteristics of the focus groups

Degree	Program/ Institution	Number of teachers	Male/Female	Drawings	Research attributes (small cards)
Social Work	A/1	4	1/3	3	23
	A/1	3	2/1	2	16
	A/1	6	4/2	6	26
	A/1	4	3/1	4	25
	B/2	7	6/1	10	6
	B/2	6	4/2	8	7
	C/3	4	1/3	2	8
	C/3	3	0/3	6	9
	C/3	5	3/2	2	12
Education	D/1	3	0/3	0	8
	D/1	3	½	2	11
	D/1	4	2/2	0	13
	D/1	3	0/3	0	8
	D/1	3	0/3	0	10
	D/1	3	0/3	0	8
	E/4	2	2/0	2	20
	E/4	2	2/0	0	0
Allied Health	F/2	3	1/2	3	17
	F/2	4	0/4	4	22
Communication	G/5	7	2/5	1	6
Total	7/5	79	34/45	55	255

Analyses

All focus groups were audiotaped and transcribed verbatim. Analysis, for this paper, focused on the fifth phase of the focus groups, where the participants were asked to specify the meaning and importance of the general research attributes for their teaching context.

Given an initial coding protocol, based on a sample of teachers' drawings (N=35) and associated small cards (N=103), the two first authors individually analyzed two focus groups. They discussed their analysis together, refined the protocol and analyzed again two other focus groups (Miles & Huberman, 1994). After three iterations the coding protocol was sufficiently detailed to analyze reliably. A high inter rater reliability was obtained (Cohen, 1988). Cohens' kappa ranges between $\kappa = .76$ and $\kappa = .91$. All other focus groups were then analyzed by the first author. The second author analyzed two additional focus groups to guarantee consistency in the analysis.

Results

Discussing the meaning and importance of the general research attribute CT for teachers' teaching context, revealed remarkably different reinterpretations of CT. More specifically four different specifications were identified: (1) Critical attitude towards oneself, (2) Critical attitude towards information, (3) Conscious of the perspective of others, and (4) Able to handle uncertainty.

Table 3
Contextualized interpretations of the general research attribute CT

Specification	Description *Example*
Critical attitude towards oneself	Students are able to think critically towards themselves, their own way of acting and the own frame of reference. *The student can critically analyse the own behaviour during an internship according to the theoretical framework used in the module.*
Critical attitude towards information	Students are able to think critically towards information and the development of information and knowledge. *The student can critically interpret historical data and apply this critical sense in the interpretation of the present.*
Conscious of the perspective of others	Students are conscious of the perspective or framework of others. *The student can put herself in the perspective of each actor in a given problem.*
Able to handle uncertainty	Students are able to stand and cope with uncertainty. *The student can formulate a conclusion based on mixed and incomplete information.*

Discussion

A strong but hazy theme in the research-teaching literature is the relationship between teachers' research conceptions and teachers' teaching practices, in particular teachers' research integration practices. Given the insights of Norton et al. (2005) in the mediating role of teachers' contextualized teaching conceptions in the teaching conceptions- practices relationship, this study looked at teachers' contextualized research conceptions. In particular, teachers' contextualized conceptions of the research attribute CT are investigated.

Analyses revealed CT is understood in diverse ways when teachers refer to their teaching context. No less than four different specifications of CT were identified: (1) Critical attitude towards oneself, (2) Critical attitude towards information, (3) Conscious of the perspective of others, and (4) Able to handle uncertainty.

At first sight finding are in line with the literature illuminating CT as a multifaceted concept (see e.g. Halpern, 1998). This diversity is exemplified by the variety of existing definitions on CT (see e.g., Bailin, Case, Coombs, & Daniels, 1999; Butler, 2012; Facione, 1990; Halpern, 1998). Angeli and Valanides (2009) pointed at the difference in definitions considering CT as a set of cognitive skills or as a disposition to be a "critical thinker". In the literature the concept of CT is often perceived as a set of thinking skills (Bailin et al., 1999). These skills include for example: taking into consideration multiple perspectives, examining implications and consequences, resolving disagreements with reason and evidence, and re-evaluating a point of view in light of new information (Bailin et al., 1999). Moreover, the majority of researchers indicate that CT includes a dispositional component, referring to a motivational dimension of CT (Verburgh, 2013). The CT dispositional component includes open mindedness, truth-seeking and inquisitiveness (Facione, 2010). Verburgh (2013) pointed to differences in definitions considering CT as discipline-specific or discipline-general. However, the four distinguished interpretations of CT are not fully traceable or grasped in current definitions of CT in the relevant research literature (e.g. Abrami et al., 2008; Bailin et al., 1999; Butler, 2012; Niu, Behar-Horenstein, Garvan, 2013). In particular a self critical attitude (Critical attitude towards oneself) is not retrievable in literature. To some extent, it aligns the skill 'self-regulation' of Facione (1990). Nevertheless, the different interpretations can be linked to other concepts discussed in the more broader educational literature. '*Critical attitude towards oneself'* for instance, refers to the ability to question one's personal way of acting and one's personal frame of reference . It is comparable to the "Self-critical attitude" in a research attitude defined by van der Rijst (2009), implying being critical towards one's own ideas. '*Critical attitude towards information'* implies being able to critically assess information and the way it was developed. This is most directly related to the CT literature. It is related to the 'Critical attitude towards others' and 'Critical attitude towards observations and experiments' in a research attitude as defined by van der Rijst (2009). '*Conscious of the perspective of others'* refers to being able to see the perspective or frame of reference of others. It directly relates to a comparison between one's own perspective and that of others especially in the context of social relations. It aligns Facione's (2010) 'understanding of the opinions of other people'. '*Able to handle uncertainty'* includes the ability to stand and cope with conflicting information and accept that each position contains aspects of truth. These last two interpretations are closely related to 'metacognition' (Efklides, 2008) and 'advanced epistemological beliefs' (Perry, 1970) or 'advanced stages of reflective thinking' (King &Kitchener, 1994). Reflective thinkers in the model of King and Kitchener (1994) fully master these skills, as they recognize uncertainty and the construction of knowledge while also acknowledging that knowledge must be understood in relation to the context in which it was generated.

The study –while limited to only one aspect of research conceptions- illustrates that teachers' reinterpret the meaning of CT when their teaching context comes to the front. The typically hidden nature of these specifications is interesting. As far as we know, other studies did not address the contextualized research conceptions of teachers. It is easily assumed that teachers hold a certain general view on research or CT, and therefore strive at integrating research or CT into their teaching in congruence with this general view.

From a curriculum point of view, differences between teachers' general and contextualized research conceptions are extremely important. Making teachers' contextualized research conceptions more

explicit, could help understanding teachers' initiatives for relating research and teaching and it would simplify the discussion concerning integrating research in teaching practice. For instance, a teacher who contextualizes CT into: 'Students are able to think critically towards themselves and their own way of acting' might opt for a different teaching approach than a teacher who contextualizes CT as 'Students are able to think critically towards information and the development of information and knowledge.' This study suggests that teachers' contextualized research conceptions might be more closely related to their teaching practice than their general research conceptions. While this hypothesis needs further systematic research, the study of Van Hertbruggen (2013) provides a first indication of its validity. She retrieved a stronger relationship between teachers' contextualized research conceptions and research-integration practices than between these practices and general research conceptions.

Still, when interpreting the results attention should be paid to at least three limitations. First, the results are based on an opportunistic sample. All programs volunteered to participate and were interested in the research-teaching relationship, which might result in well-considered general and contextualized research conceptions of the teachers. While the specific interpretations may differ in other contexts, the main thesis of the study remains: i.e. the link between research conceptions and teaching practice is mediated by interpretations. Second, given the use of focus groups the results are limited to the group level, which does not always mirror the individual teacher's authentic point of view. Third, the introduced framework provides an one-way perspective on the relationship between teachers' research conceptions and research integration practices. The study is grounded in the understanding that teachers' research conceptions drive teachers' research integration practices. Other factors influencing teachers' research integration practices remained out of scope. First of all, contextual factors such as discipline, class-size and type of course remained out of scope, while in the literature on the relationship between teaching conceptions and practices influences of these factors are illustrated (see e.g., Lindblom-Ylänne, Trigwell, Nevgi, & Ashwin, 2006). Next to this, teachers' teaching conceptions remained out of scope, although the effect of teachers' teaching conceptions on their teaching practices is also well documented (see e.g., Kember, 1997).

Notwithstanding these limitations, the study and inherent framework immediately raises questions and ideas for further research. Foremost is the question as to whether different contextualized conceptions of CT result in different teaching or research integration practices. An interview study with teachers about the interplay between their general research conceptions, contextualized research conceptions, and teaching practices would complement the results of this study. Second is the specific relationship between contextual variables and teachers' interpretations.

The study deepened our understanding of teachers' conceptions of CT. Illuminating teachers contextualize their general conception of CT, when their teaching context comes to the front provide a new and promising view on the research-teaching relationship, and in particular the relationship between teachers' research conceptions and research integration practices. Contextualized conceptions of CT, or more broad contextualized research conceptions, are a promising starting point for investigating the relationship between conceptions and related teaching practices. Nevertheless more research is required before an in-depth understanding will be established.

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